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SHOULD BE USED.

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BY H. N. SMALL, M. D.,

INSTRUCTOR OF OBSTETRICS, PORTLAND SCHOOL FOR MEDICAL  
INSTRUCTION, PHYSICIAN TO THE MAINE GENERAL HOSPITAL,  
ETC., ETC.

*Read before the Cumberland County Medical Society, October, 1882.*

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## HOW THE OBSTETRICAL FORCEPS SHOULD BE USED.

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I trust you will pardon me for the way I present this subject to you, and do me the justice to believe, that I am fully aware that I am addressing many first class obstetricians, and that my only excuse for reading this paper before you is that I may hear a subject discussed, that I am deeply interested in, and the benefit I anticipate not only for myself, but for the other students present.

If I understand rightly, the only proper and honest use of the obstetrical forceps requires a perfect knowledge of the instrument itself, its form and capabilities, of the pelvic canal where it is to be introduced, of the body on which they are to be applied, and of labor governed by natural powers. And I may as well say at this point, that I do not consider the forceps an unnatural resort like the Cæsarean Section, but an instrument properly used to assist, and in the course or manner of natural labor.

I am well aware that there are conflicting ideas in regard to the employment of them, that there are a great many shapes and many designs in common use, which plainly indicate that an exact basis has not yet arrived, or been well understood.

It is of course important for us to have a right understanding of normal labor to know *how* to assist.



In the mechanism of labor we must recognize a body to be expelled, a canal through which it passes, the power which accomplishes the expulsion.

I do not propose to dwell on the anatomy of the pelvis, which Playfair so well says: "Is the alphabet of obstetrics," for of course a thorough knowledge in that direction should be understood by us all.

Now the forces in use in the mechanism of labor are expulsive and guiding. The expulsive power is from uterine muscular contractions, and aid from the voluntary muscles. These forces are communicated to the spinal column of the child, and act first in the long axis of the womb, therefore the child is propelled in the axis of the canal. The abdominal muscles exert their force in the same way to the child. We find, however, that the action of the muscles of the abdomen are not, as a rule, called into action until the head has escaped from the womb.

But from the inclination of the pelvis to the spinal column, each of these forces, the uterine and abdominal, tends to propel the child to points behind the center of the plane of the outlet.

The abdominal muscles, acting first in the axis of the plane of the conjugate diameter, impel it toward the end of the coccyx. This tendency is modified by the guiding forces reflected from the sides of the pelvic canal, which is spiral in shape, and consists of continuous inclined planes. From the pelvic inlet to the outlet of the vagina, the head follows a very different course, emerging from the latter in a direction which forms an acute angle with the produced axis of the plane of the conjugate diameter.

It is very evident that the same force cannot act in two directions, one of which is almost the reverse of the other. There must be, then, a new force beyond the pelvic outlet acting in a different direction.

This we find in the perineum. When the combined,

expulsive and guiding forces have brought the head to, and nearly through the pelvic outlet, it is met by the opposing force existing in the elastic resistance of the perineal body, assisted by the associate structures of the pelvic floor.

The latter force acts in a direction nearly opposite to the former, and the head is, therefore, directed forward in the line of the two forces. Another force may assist in delivery, that is *gravity*. I think we have reason to believe that the amount of force employed in truly normal labor is small.

Mathews Duncan says: "If we regard the figure of four pounds given by Poppel as equal to the power exerted in the easiest labor he has observed, and keep in mind that the average weight of the full term foetus is nearly double this weight," we are led to conclude that in the easiest labors, almost no resistance is encountered by the child; that it glides into the world propelled by the smallest force capable of doing so; that with the mother in a favorable position, the weight of the child is enough to bring it into the world, a result which many clinical facts appear to confirm. Now the foetus, for whose sake all this wonderful machinery is ordered, is, when in the womb, closely packed in the shape of an ovoid, at one end is the head, the other the breach. It is natural for it to pass like an egg, through the pelvis, endwise. The child may attempt to enter the pelvis transversely.

Therefore we see in all obstetrical works, description of four presentations. first, *vertex*, second, *face*, third, *breach*, and fourth, *transverse*. Most authors declares the vertex presents 90 to 95 times in 100, and of course this is acknowledged to be the normal presentation, and the one best agreeing with the pelvic canal, therefore, it seems proper for us to dwell upon head presentation, for *breach* and *transverse* presentations we can hardly call normal, or proper ones for the use of the forceps. At this point it is proper for us to refresh our minds in regard to the anatomy of the foetal head. We must remember its sutures and fontanelles, the parietal

protuberances, the frontal eminences. Certain planes and diameters are described by all modern authors. The knowledge of them is of wonderful assistance. The different positions of the head in its descent, changing the outline of the presenting part, and the relation to the pelvic canal is important to understand. How much easier it is to sit by the bed-side, the back will not ache half so much if we are watching with the index finger the relative positions of the fontanells during the changes. How interesting it is to watch the changes in the bi-parietal, and the occipito frontal and mental diameters by the over-lapping of the bones, thereby correcting to a great degree disproportions, and perhaps changing in form the entire head, and all this without damage to the child.

I do not propose to dwell on the mechanism of delivery in the various presentations and positions, but will simply refer to the correspondence of the diameters of the parturient canal, and the diameters of the foetal head, and that the head may enter either in the right or left oblique, giving the four positions of vertex which all recent authors acknowledge. First, left anterior occipito-cotyloid, second, right anterior occipito-cotyloid, third, right occipito sacro-iliac, and fourth, left occipito sacro-iliac. Much can be said in regard to the relative frequency of these positions. Some of our best authors, I find, declare that the head lies in the right oblique (or its first position, occipito left anterior) in 95 per cent. of all cases.

For several years I have endeavored in all labor cases, as far as I have been able, to make out early as possible presentation and position, and this experience leads me to doubt the accuracy of these figures. I believe the second position, occiput in the right anterior, is much more common than most of the authors teach. And also the third and fourth. I believe you will all see the importance of dwelling on these points by way of introduction to our subject proper.

Ever since the rude beginning in the instruments invented



by Chamberlen, the medical profession have been united in blessing the forceps. And is it not right for the profession to be enthusiastic when it is so plain what they can do to diminish suffering and save life? But I admit that the forceps have been justly charged with much harm, and in the minds of many there are doubts concerning them. It is proper to ask this question, is the fault in the instrument or the user? Playfair says: "Of all obstetric operations, the most important, because the most truly conservative both to the mother and child, is the application of the forceps. In modern midwifery, the use of the instrument is much extended, and it is now applied by some of our most experienced accoucheurs with a frequency which older practitioners would have strongly reprobated. That the injudicious and unskillful use of the forceps is capable of doing much harm, no one will for a moment deny. This however, is not a reason for rejecting them or the recommendation of those who advise a more frequent resort to the operation, but rather for urging on the practitioner the necessity of carefully studying the manner of performing it, and of making himself familiar with the cases in which it is easy, or the reverse." We will, if you please, gentlemen, call the forceps a pair of artificial hands to grasp the foetal head and draw it through the parturient canal, when it cannot pass spontaneously, not simply a pair of iron tongs to be hitched on somehow to the child, and somehow pulled into the world. In the use of them our object is to deliver a living child, and not produce any injury to the mother. I shall not attempt to trace in a historical way the various changes that have been made in the forceps from Chamberlen to the present time, but will say a few words in regard to the forceps now in use, and considered the best. I believe the blades should be large enough to cover considerable of the surface of the head, for if so the hold is more certain, and at the same time there is much less pressure on any one part. The blades should be thin enough

to take up as little room as possible, thereby not increasing the diameters of the part presenting. I like a wide blade and large fenestrum to fit well over the parietal bones. If the blades are narrow we get an unequal pressure, and mark the head much more.

I am aware that new beginners find it much easier to introduce a narrow instrument, but with confidence that practice alone brings, the wide blades are most always easily applied. I think a great improvement has been made in what Playfair calls the cephalic or head curve. By having this well formed we avoid using pressure to prevent their slipping, which is so dangerous to the mother and child, and so mortifying to the operator. Blades with slight curve produce a very dangerous lateral pressure, and may very likely injure the brain of the child. I am satisfied that what we want is an instrument that will hold the head firmly with very slight compression. A few words in regard to the pelvic curve of the instrument. We remember the form of the parturient canal from the superior strait to the vulva outlet, and that the direction of the axis is nearly opposite.

I am aware that the curvature, as far as is produced by the soft parts, the pelvic floor, we can overcome by pressing downward on the handle of the instrument, and that forceps quite straight may be applied to the head when it is at the entrance of the canal; but is it not more reasonable to believe that an instrument formed to correspond to the curve of the canal is not only easier to apply, but when traction is made is in the line of the axis of the canal, and as I said when I commenced this paper, its use should be to assist in the course of natural labor. I believe we should be just as decided in regard to the curve of the forceps, (for the high operation) as we are in regard to the curve of the male catheter. We can apply such blades at any point in the canal. A few months ago, I had constructed for my own use, for difficult high operations, in which I disliked on the

child's account to produce version, an instrument which has a pelvic curve which I believe corresponds to the canal, and a head curve in which the tips of the blades approximate to such a degree, that when the forceps are applied and traction is made the blades so grasp the farther end of the head, with a secure hold, and help to push it on, no compression of any amount is required, and, what I hardly expected, I find that with these instruments applied as we are obliged to at the superior strait, the pelvic manner, thereby grasping the fetal head as it enters obliquely, with very little power, the head will come down rotating within the blades, so that at the lower strait I find the head has taken readily the normal course occipito-pubic.

The handles are the same pattern as the Elliot forceps, but a little longer, giving a better leverage power to the instrument. I have a screw at the end of the handles to regulate compression. I was very careful to have the blades carefully rounded to avoid injury to the mother or child. The shank of the instrument is  $3\frac{1}{2}$  inches in length, so that when applied at the superior strait the lock is not near enough to the maternal tissues to pinch them. To lock the instrument, I have one blade provided with a slot, and the other with a pivot with a large upright screw-head.

I like this form of lock, for if the blades are not just opposite each other, upon the head, the pivot cannot be pushed into the slot. When they are exactly opposite it is easily entered and the screw rotated between the thumb and finger is made perfectly fast.

In closing this part of my paper, I wish to say that there is no doubt that special skill in the use of any double curved forceps may enable an operator to use it well, but I think the same amount of skill devoted to an instrument of this kind will be more satisfactory. Now in regard to the manner of application of the forceps, we, in the first place, consider them adapted for the head of the child, and may be used in any of



its presentations or any of its positions, and any where in the parturient canal. We remember that the head may be arrested, (or usually is) either at the entrance of the canal, its outlet, or when upon its floor. Now the method of using the forceps is very different in these conditions.

I will not now dwell upon the preliminaries, as the position of the patient, arrangement of assistance and the importance of avoiding exposure of the patient, but come at once to the manner of application of the blades at the inlet. I tried for several years to follow the advice of some of our leaders in obstetrics and apply them to the sides of the child's head. The arguments used by them that they would fit the head better and safer was plausible, but I always found that with all my efforts, the blades would find their way to the sides of the pelvis, and the marks on the child would show that I had grasped over the brow and the side of the occiput. Now I always apply at the superior strait in the pelvic way, and since I have used the forceps with the head curve that I have described, I find by traction, as the head descends as in normal labor, that it rotates within the blades. I think when the head has well entered the pelvic brim, and is in either oblique, and labor is arrested because the head cannot rotate, we should use a pair of forceps with less pelvic curve, and apply them to the sides of the child's head. Of course they fit the head much better, are not so likely to injure the child, have more and much better control, and it is much easier to flex or extend the head if it is grasped in this way. And again, if it is a case demanding compression to reduce its size, it is much easier done. It is just as easy if the pelvis is of natural form to apply them this way. Now in regard to the manner of introducing the blades. We will take a case of first position, (left anterior) the head has entered the pelvic brim and is lying in the right oblique. We find the head in this case closely applied to the pelvic brim upon the right posterior, and the left front. We find with the index finger



that the left parietal bone is opposite the left sacro-illiac arch. Now in this position we can place a blade just where we desire on the left side of the head, for we have here most ample room. Not so easy is the application of the other blade. This one has to be passed between the right side of the head and the pelvic brim. A question that disturbed me for a long time was to decide which blade to introduce first. Now remember that the head in entering the pelvic brim is parallel to the entrance of the brim. We find the side of the head that is posterior, which is of course the left in the first position, the right side being *near* and to the front. Now this being the fact will decide the question, for we see that if the anterior was introduced first it would be very awkward, when we attempt to use the other blade for it would be in the way.

After a careful settlement of these important questions, we are now ready to proceed. We will calmly place our patient upon the back transversely in the bed, the hips well to the edge of the bed, and procure such level-headed assistants as we can find in the vicinity, one to hold each limb, flexed and outward, and as I have intimated a sheet over the limbs to avoid exposure, (which every gentleman will think of) a chair for the operator, plenty of towels, and some lard or cosmoline. Ascertain if the bladder is empty. I take it for granted the nurse has attended to her duty and given an enema to empty the rectum. After these questions have been settled the operator sits in front of the patient, takes what some call the male blade of the forceps, which should be of comfortable temperature and well greased with lard or cosmoline, the two first fingers of one of the hands, (some prefer one some the other) are passed into the vagina until the tips of the fingers are placed between the neck of the womb and the child's head, I think this part of the operation should be done with the very greatest caution, for fear that the blade may pass outside of the cervix, and do much injury. I am in the habit of holding (as I introduce) the instrument by the handle, like

a pen, although most authors say this hold is not secure. The end of the blade is now introduced in the vulva, resting on the palm side of the fingers already introduced, while the end of the handle is held above the middle of the mother's groin. Now that this blade is to travel over the entire posterior curvature of the pelvis before it comes in contact with the head, the pelvic curve of the instrument is to be first carefully considered, and should be passed as we do a male catheter. We find as the blade glides up, the end of the handle moves forward, and with slight depression until the blade has arrived to the side of the child's head. The head curve of the instrument we should now think of, and the blade made to pass around the convexity of the head. As we accomplish this movement the handle of the instrument is made to approach, and cross the median line, and is at the same time depressed. Now when we have finished the introduction, the blade is in the left sacro-iliac space, and on the left side of the child's head, the handle resting on the perineum.

The introduction of the male blade is generally very easy. The second or female blade is not applied so easily. We find when introducing that the right side of the child's head is much nearer than the left, and the fingers of the hand used to guide are not introduced as far. We find the right side of the head is so near that the cephalic curve of the blade has to be considered at the same time that we do the pelvic curve. At once, nearly as we introduce the blade, it must be curved around the head. The part to which we strive to apply the blade is nearly over the right obturator foramen, therefore, the handle is at once moved toward the median line, and depressed as soon as it is clear of the mother's left leg. I have said that the introduction of the second blade is more difficult than the first. The amount of force we should use cannot very easily be measured, but I believe that when we are perfectly aware of the true position of the child's head, it

is not necessarily very great. But when the other blade is well introduced the handle of it will be across the first, and the slot comes exactly opposite the pivot, and with the slightest manipulation we can lock the instrument. If the lock does not come easily and perfectly together, I believe we ought to remove the second blade and try again until it comes right. Now when this is accomplished easily and perfectly, we have positive evidence that we have the blades over the parietal bones, and we can properly commence traction. Again, I think we will receive assurance by the position of the handles. If we have a first position, and the blades are applied bi-parietal the upper side of the handles are directed toward the patient's left side. Sometimes now, and often years ago, I felt that I had the blades properly applied, but when I attempted to lock the instrument, I found the lock so far apart that I could not bring the shanks together and lock. I think in such complications the blades are not introduced high enough to properly grasp the head. To remedy this, my custom is not to withdraw the blades but press the handles downward against the perineum, and then they will lock very easily. I am governed by the same rule in applying the forceps in the first and third positions, for of course the head is in the right oblique. When the head is in second or fourth positions, or in the left oblique, the order of applying is exactly the reverse.

Now allow me to say a few words in a general way. I never introduce the forceps during a pain. If the instrument causes pain I wait until it is over. I do not very often give an anæsthetic, unless it proves to be a severe case. I think the sensations of the patient a valuable guide. If we cause pain I believe we are bunglingly using the instrument. I certainly believe new beginners ought not to use the anæsthetic before they are applied. I have no objections after they are applied to use the anæsthetic cautiously, not to full anæsthesia, for I believe there are objections. I do not

believe in getting excited, and dripping with perspiration when we find the blades do not go on easily, for if we do we are apt to do damage.

I believe when we begin to lose perfect self-control, it is better to stop for a while, and think over the case and make up our minds where the trouble is, and if satisfied, try again.

Now we have the forceps perfectly applied, what are we to do now? Shall we pull the head out by direct traction; or pry it out? and shall it be compressed while doing this? I say in answer, direct traction in the axis of the canal. The line of the blades should be parallel with the axis, and very slight leverage power used, in short, imitate normal labor. I know some have great confidence in what is called pendulum motion, but it would seem as if the laws of mechanics are altered for obstetricians if such motion is right, but still there is a reasonable medium. I think traction is more effective with a cautious leverage. When the head is at the upper strait, I make traction with the right hand, while I prevent the anterior pressure of the forceps by putting the left hand upon the lock and pressing downward, using it as a fulcrum. I think we should be careful that the force applied by the right hand is not enough to over balance the downward pressure of the left, for if it is, we will merely extend the head without advancing it. When the head begins to come down we may place two or three fingers between the blades, the thumb and little finger being on the outside, and combine a pulling with a pushing motion upon the blades. The handles should be properly elevated as the head descends and brought into the median line only when the head has reached the lower strait, and when the head has passed the vulva opening the handles lie on the abdomen of the mother. I hope I have made myself understood that traction in the right direction need not as a general thing be strong. And that it is true that traction which pulls the head against the pubis instead of in the pelvic axis must be powerful. I am well aware,



that now and then we meet with cases where great force is required, in which method has to be modified, but I believe in such cases we should use our right hand as strong as possible, while, at the same time, we must do what we can to change the force in the right direction, with the left hand pushing upon the blades or shank. I do not believe it is often necessary to take hold of the handles with both hands, or brace the foot against the bed, or have some one grasp around the waist. I believe force used in this way is almost sure to do injury to the mother as well as the child. Now after my efforts to describe what I mean by traction, I wish to say a word about the details of the operation. The traction I always endeavor to make during a pain, and stop between them. If there is insufficient or no pain I make efforts by way of imitation. If my case is taking considerable time I am in the habit of unlocking the forceps for a few moments and perhaps allow a pain or two to occur before relocking again. Of course the time taken to deliver varies greatly in different cases. Somebody once said that it was soon enough done when it was well done. I do not think we should be governed by any rule, I think it is the duty of all of us who are teachers in our profession, to impress upon the minds of students, that there is nothing to be gained by getting excited, and hanging and pulling with all our powers on the handles of the instrument, but that if the force is used *in the right way, any power we can bring to bear may be safely used*, for our safety valve is that much force cannot be used if it is used right. In making traction I try to make an exception when the head is bulging the perineal body. I then make my traction between the pains, and I believe there would be fewer perineums ruptured if we made this our rule, especially when the expulsive pains are hard. I find myself often removing the forceps when the head is nearly born, but I confess I do this simply to see the labor terminate spontaneously.

I do believe, carefully manipulating with them, we are less

liable to have the accident occur, but a wrong turn of the instrument at the critical moment may produce a laceration. I would advise any new beginner to take them off rather than run the risk, no matter what Mrs. Grundy will say.

And taking off the forceps I believe should be done with the greatest caution to prevent injury to the maternal structures.





